

THE CLAIMS

We claim:

1. A golf ball having one or more layers comprising a base rubber material, wherein at least one layer of the golf ball comprises greater than about 60 parts of one or more pre-vulcanized or pre-crosslinked material per 100 parts of base rubber material; and
 5 wherein the pre-vulcanized or pre-crosslinked material in the at least one layer is re-crosslinked by high pressure, high temperature sintering.

2. The golf ball of claim 1, wherein the at least one layer of the golf ball comprises from about 60 parts to about 200 parts of one or more pre-vulcanized or pre-
 10 crosslinked material per 100 parts of base rubber.

3. The golf ball of claim 2, wherein the golf ball comprises from about 70 parts to about 150 parts of one or more pre-vulcanized or pre-crosslinked material per 100 parts of base rubber.

4. The golf ball of claim 1, wherein the golf ball comprises one or more of a
 15 core, intermediate layer, and cover, wherein the pre-vulcanized or pre-crosslinked material is disposed in at least a portion of the core, intermediate layer, cover, or a combination thereof.

5. The golf ball of claim 2, wherein the pre-vulcanized or pre-crosslinked material is a thermoset material selected from the group consisting of a thermoset natural or synthetic rubber, thermoset polyurethane, thermoset polyurea, thermoset polyolefin,
 20 thermoset phenol-formaldehyde resin, thermoset amino resin, thermoset furan resin, thermoset unsaturated polyester resin, thermoset vinyl ester resin, thermoset cyanate esters, thermoset acrylic resins, thermoset epoxy resin, thermoset silicones, thermoset polyimides, styrene butadiene; polybutadiene; isoprene; polyisoprene; *trans*-isoprene; ethylene propylenediene rubber; fluoroelastomer; silicone rubber; epoxy rubber; nadimide-, cyanate-
 25 or maleimide-terminated thermosetting polyimides; and mixtures thereof.

6. The golf ball of claim 1, wherein the pre-vulcanized or pre-crosslinked material further comprises a *cis*-to-*trans* catalyst and free radical source; a crosslinking agent; a vulcanization accelerator; an anti-reversion agent, or a mixture thereof.

7. The golf ball of claim 6, wherein the anti-reversion agent is 1,3-*bis*-(citraconimidomethyl)benzene, hexamethylene-1,6-*bis*(thiosulfate), or a mixture thereof.

8. The golf ball of claim 1, wherein the golf ball has an Atti compression of at least about 40.

5 9. The golf ball of claim 1, wherein the golf ball has a coefficient of restitution of at least about 0.7, and wherein the golf ball has an initial velocity of about 245 ft/s or greater.

10. The golf ball of claim 1, wherein the golf ball has a coefficient of restitution of at least about 0.78.

10 11. The golf ball of claim 1, wherein the golf ball has a ball spin rate of about 1200 rpm to about 4000 rpm when the golf ball is hit with a golf driver.

12. The golf ball of claim 1, wherein the golf ball has a ball spin rate of about 6500 rpm to about 10,000 rpm when the golf ball is hit with an 8-iron.

13. A golf ball having one or more layers consisting essentially of one or more pre-vulcanized or pre-crosslinked; and
15 wherein the pre-vulcanized or pre-crosslinked material in the at least one layer is re-crosslinked by high pressure, high temperature sintering.

14. The golf ball of claim 13, wherein said golf ball is a 1-piece golf ball.

15. The golf ball of claim 13, wherein the pre-vulcanized or pre-crosslinked material is a thermoset material selected from the group consisting of a thermoset natural or
20 synthetic rubber, thermoset polyurethane, thermoset polyurea, thermoset polyolefin, thermoset phenol-formaldehyde resin, thermoset amino resin, thermoset furan resin, thermoset unsaturated polyester resin, thermoset vinyl ester resin, thermoset cyanate esters, thermoset acrylic resins, thermoset epoxy resin, thermoset silicones, thermoset polyimides, styrene butadiene; polybutadiene; isoprene; polyisoprene; *trans*-isoprene; ethylene
25 propylenediene rubber; fluoroelastomer; silicone rubber; epoxy rubber; nadimide-, cyanate- or maleimide-terminated thermosetting polyimides; and mixtures thereof.

16. A golf ball having one or more layers comprising substantially of one or more pre-vulcanized or pre-crosslinked material; and

wherein the pre-vulcanized or pre-crosslinked material in the at least one layer is re-crosslinked by high pressure, high temperature sintering.

17. The golf ball of claim 16, wherein the pre-vulcanized or pre-crosslinked material is a thermoset material selected from the group consisting of a thermoset natural or
5 synthetic rubber, thermoset polyurethane, thermoset polyurea, thermoset polyolefin, thermoset phenol-formaldehyde resin, thermoset amino resin, thermoset furan resin, thermoset unsaturated polyester resin, thermoset vinyl ester resin, thermoset cyanate esters, thermoset acrylic resins, thermoset epoxy resin, thermoset silicones, thermoset polyimides, styrene butadiene; polybutadiene; isoprene; polyisoprene; *trans*-isoprene; ethylene
10 propylenediene rubber; fluoroelastomer; silicone rubber; epoxy rubber; nadimide-, cyanate- or maleimide-terminated thermosetting polyimides; and mixtures thereof.

18. The golf ball of claim 16, wherein said golf ball is a 1-piece ball.

19. The golf ball of claim 16, wherein said golf ball has an Atti compression of at least about 40, a coefficient of restitution of at least about 0.7, an initial velocity of about 245
15 ft/s or greater, and a spin rate of about 1200 rpm to about 4000 rpm when the golf ball is hit with a driver.